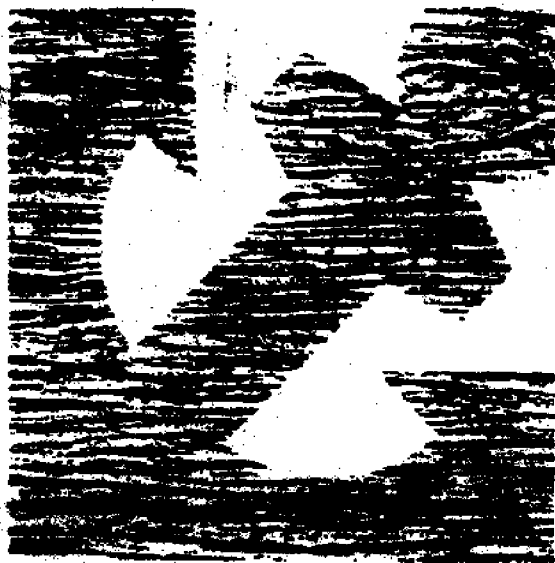


Marine Offshore Outlook 1983

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Compiled by
DEWAYNE HOLLIN
Marine Business Management Specialist



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June 1983

TEXAS A&M UNIVERSITY SEA GRANT COLLEGE PROGRAM
College Station, Texas 77843

MARINE OFFSHORE OUTLOOK

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BOOM TO BUST - WHERE NOW FOR THE OFFSHORE INDUSTRY?
G. ALLEN BROOKS, Offshore Data Services, Inc.

During the past 10 years, since OPEC gained control of oil pricing, the petroleum industry has lived in an extremely complex world. It appears this world will remain complex for the foreseeable future since the ability to forecast oil prices beyond about 6 months has proven almost impossible. There is little doubt the collapse of the petroleum industry in 1982 was the most severe contraction ever experienced in the industry's history. Activity, as measured by the Hughes Tool Company rig count, dropped from a high of more than 4,500 total drilling rigs in November 1981 to less than 2,000 currently. A correction of this magnitude, however, has not been experienced by the offshore industry despite today's low mobile rig fleet utilization of 77 percent. Since 1960 the offshore industry has experienced steady growth, measured by the number of wells drilled offshore. This steady growth has been most pronounced in the number of exploratory wells drilled, as development drilling was shut down once because of several offshore accidents in 1969 and 1970.

The offshore industry will continue to grow in the future. Four-fifths of the world's surface is covered by water. The outer continental shelf, slope and rise represent 20 percent of this offshore area, yet only 30 percent of it is leased. Only a small portion of the leased acreage has been explored, and the greatest percentage of yet-to-be discovered hydrocarbon reserves lie under these waters. All offshore acreage is controlled by governments that place numerous work commitments on the companies obtaining leases. This facet alone assures a certain amount of offshore activity.

What brought the offshore industry to today's hard times? The boom of 1980-81 had its seeds in the first OPEC price increase in 1973. World economies had been on an energy consumption binge encouraged by low oil prices. Despite the jump in oil prices from \$3 per barrel to \$12, energy consumption continued to rise, albeit slower than previously. Following the jump in oil prices in 1978, the fear of another Middle East oil cutoff, coupled with the prospect of further price increases, produced a dramatic effect on industry expectations. Unobserved by the petroleum industry, the laws of supply and demand were working and conservation became a meaningful force. Energy demand dropped, as did world economic activity. As demand dropped, the world found that high oil prices could produce oil discoveries outside the Middle East. While demand continued dropping and non-OPEC oil supplies kept appearing, something had to give. Indeed, world oil prices fell. But more importantly, expectations about future energy prices were cast upon the rocks and smashed to pieces. However, this destruction did not occur overnight. In the United States the growing gas bubble added further downward pressure on a faltering petroleum industry. In a matter of months the petroleum industry deflated, the full impact of which we are only now beginning to see. With this background, we will examine the forces which influence offshore activity including price, demand, geology, acreage, technology and capital formation.

Oil price is the key factor, but it is a function of energy

demand. The drop in oil prices appears to have stabilized with the new \$29 per barrel benchmark price. How long this price holds is anyone's guess, but after the warm winter worldwide and one of the longest and deepest worldwide recessions, energy demand has probably dropped to its low. In the near term high oil inventories will come down continuing to put pressure on OPEC's production and pricing decisions. In the future we can look forward to a pickup in U.S. energy demand as a result of the economic recovery which is clearly underway. The economic sectors which are leading this recovery - housing and autos - are the most energy intensive parts of our economy. I suspect that after we are well into this recovery we will learn that our elasticity of demand is greater on the up side than everyone thinks, just as it was on the down side of the recession. Any growth in energy demand will be a welcome change from the past 2 years. The drop in oil prices, and now natural gas prices, has dealt a death blow to synthetic fuel projects. And we know how bleak the future for nuclear energy is in this country. Thus the stage is set for oil and gas to supply a large portion of our energy demand during the remainder of the century, even if its share of total energy shrinks. While OPEC's price drop was a first for that organization, it certainly was not the first time in history fuel prices have declined. Unfortunately, not everyone in the world benefited from the decline in oil prices. During the past 2 years when the U.S. dollar was so strong against foreign currencies, many countries actually experienced price increases, measured by their purchasing power. Offshore Data Services believes OPEC, even in its weakened state, will still be strong enough to exert influence on the price of oil. We expect the market price to remain stable for the next several years before moving upward at a rate slightly in excess of the rate of world inflation.

Where will we find the sources of our new supplies? Shell Oil, in its recent annual report, predicted that one-half of its new oil and gas discoveries to the year 2000 would be in deep water and offshore Alaska. While this is a strong statement about the future, it is supported by estimates that 20 percent of the world's total hydrocarbon reserves are located offshore. Indeed the amount of oil and gas yet to be discovered offshore is between one-and-a-half to two times the amount of present offshore reserves. These estimates argue for a bright future for the offshore industry. Will the petroleum industry be allowed to get to these hydrocarbons? Given the aggressive U.S. lease sale schedule and the number of countries around the world preparing to grant new concessions, the answer has to be yes. Interestingly, the amount of offshore acreage under lease during the past 5 years has not changed appreciably. What has changed is the ownership - national oil companies now control a larger share than in the past. Also more of the acreage under lease is in shallower water than before. From the petroleum industry's point of view, water depth does not present quite the problem it did in the past. Estimates are that wells could be drilled in 8,000 to 10,000 feet of water. However, the ability to produce oil found in these water depths is currently lacking. Fixed platforms have dominated offshore development out to the 1,000-foot mark. New platform designs are being tested which will extend this technology out to the 1,800 to 2,000-foot level. Subsea wellheads are making inroads into this deep-water area. Since deep-water exploration will probably slow with the drop in oil prices, the required technology will certainly catch up by the time it is really needed.

Ultimately all petroleum industry spending comes from wellhead revenues, or the amount of money companies get for selling their product. It is in this area that the greatest uncertainty exists in the near term.

The long-term outlook is bright, but let's examine the outlook for the 1983-1985 period. 1982 was an excellent year for the offshore drilling industry. It ended with the largest number of mobile rigs ever in the world fleet (685), the largest number of new rig additions (124), and the greatest amount of money spent for the hire of offshore rigs (\$8.1 billion). Unfortunately most of this activity was above the desired spending level of the petroleum industry. In January 1982, 493 mobile rigs were actually drilling worldwide. This count increased through September when 519 rigs were drilling. As of March 1983, 503 rigs are drilling which certainly belies the belief that offshore drilling activity has declined dramatically. The problem is that the number of rigs in the fleet expanded from 567 to 703 during this time period, creating a drop in fleet utilization.

The picture in the Gulf of Mexico is slightly different. Here active rigs declined from 164 to 145 while the fleet expanded from 176 to 208 rigs. The Gulf of Mexico has been the most impacted offshore drilling market to date. This may be more a result of natural gas surplus than anything else. The only good news for the Gulf of Mexico market is that the surge in new rig deliveries is over. We began 1983 with a total of 95 rigs under construction, of which 69 were scheduled for delivery this year. Only four were destined for the Gulf of Mexico. Thus some relief on the fleet utilization rate should be felt.

Offshore Data Services tracks all the rigs in the fleet, their status, and their economic results. Using this data we have calculated that oil companies paid \$8.1 billion last year for all drilling time used. This cost represented a 23.6 percent increase over 1981's expenditure level. In the Gulf of Mexico, the fleet required expenditures of \$1.8 billion, or nearly a 12 percent increase over 1981. The existence of idle rigs throughout most of the year indicates that expenditures were clearly in excess of the amount oil companies wanted to spend. If we assume that all rigs in the fleet during 1982 worked all contracted time at the day rates in existence at the end of the year, fleet employment costs would have been \$6.1 billion, or a decrease of 7 percent from 1981's spending level. While this is an arbitrary calculation, it probably represents the maximum down side of industry desires, since oil companies continued to enter into new contracts throughout the year.

In looking at 1983, we have made two forecasts of the cost to hire the mobile rig fleet. The first forecast is based on the rigs in the fleet working at profitable day rates which are defined as \$1,000 per \$1 million of capital investment. The other forecast, based on minimal price expectations, assumes that the fleet will work at day rates in existence at the end of 1982. Going into 1983, however, some 57 percent of the fleet's available rig months are already contracted at \$6.3 billion. Based on the minimal rate scenario for the remainder of the fleet, 100 percent utilization of the 1983 fleet would require expenditures of \$9.5 billion, or a 17 percent increase over 1982's level. Realistic? No. If the profitable scenario for day rates is assumed for

1983, required rig hire expenditures would be \$10.7 billion. This is definitely well above any reasonable expectation of current oil company spending desires.

Shifting from the supply to the demand side of the rig hire equation, our study arrives at demand estimates based on various relationships between wellhead revenues available to petroleum industry and how they are spent. The relationships are between wellhead and new exploration expenditures and between onshore and offshore spending. If we make a reasonable estimate for oil and gas demand - production about equal to that in 1982 - and assume that crude oil and natural gas prices in 1980 dollars average about current levels, we arrive at our wellhead revenue estimate. If the petroleum industry puts 20 percent of its wellhead revenues into new exploration and 20 percent of that into the offshore, between \$7.6 billion and \$8.4 billion will be available to hire offshore mobile rigs. If we compare the midpoint of this spending range to our minimal and profitable fleet cost forecasts, there is a shortfall in funds available to hire mobile rigs between \$1.5 billion and \$2.7 billion. This means many idle rigs in 1983! Another way to look at this shortfall is to use the midpoint of this available spending range versus various levels of rig fleet utilization. Eight billion dollars translates into about 150 idle rigs. As of April 11 there were 162 idle rigs, thus our forecast is tracking reasonably well. Keep in mind that some rigs located in cold water areas such as the Beaufort Sea and the Great Lakes only work during warm weather, so the number of idle rigs should decline soon.

What does this forecast mean for drilling contractors in 1983? This will be a tougher year than last year. Day rates will remain under pressure all year, which means reduced revenues and profits. Some companies in the industry will not make it through the year, at least in their present forms, and some managements may not be running their companies at the end of the year.

What does this scenario mean for the Gulf of Mexico? First it is important to recognize that the Gulf of Mexico has largely become a natural gas province as oil reserves have been added each year. However, the future for oil exploration in the Gulf of Mexico may be better than for gas over the next several years due to the gas bubble. In recent history, though, this has not been the case. In 1972 gas wells accounted for 24 percent of all Gulf of Mexico wells drilled while oil wells accounted for 30 percent. By 1981 that mix had changed to gas wells accounting for 40 percent of all wells drilled while oil wells declined to only 21 percent. If one allocates a portion of dry holes to gas wells, it is reasonable to assume that gas drilling in recent years accounted for upwards of 60 plus percent of all wells drilled in the Gulf of Mexico. The natural gas market is presently in a severe oversupply situation. Whether this is due to increased deliverability or a drop in demand is not important. What is important is that gas development activity is off sharply. For example, in March 1980, more than half the mobile rigs in the Gulf of Mexico were development drilling while in March this year less than 35 percent were. With prospects of continued gas surpluses, development drilling will continue to suffer in 1983. Another major impact of the gas surplus has been felt by owners of development drilling rigs in the Gulf of Mexico. Between November

1979, and December 1982, the number of working platform rigs, both self-contained and tender assisted, has declined by almost 25 percent, or 26 rigs. This drop in active development has come in the face of an expansion of this fleet by 8 percent, or 14 rigs.

Future development work has also fallen off when measured by the number of platforms planned and under construction. In 1982 a total of 135 platforms were installed in the Gulf of Mexico, while only 90 are planned for 1983.

Virtually every area of the offshore business in the Gulf of Mexico is feeling the impact of this drop in drilling activity. The boat business may be equivalent to the land drilling business in potential number of bankruptcies. Tax shelters, easy financing terms, and ease of entry combined to bring more capacity into the industry than could ever be absorbed in a reasonable time. So far, only four of five companies we are aware of have officially filed Chapter 11 petitions but many others may be close behind.

The diving industry along the Gulf coast is also struggling as 46 companies slug it out for whatever is available. Without a pickup in drilling and marine construction work, the pickings will be slim this year.

Internationally, the drilling market did much better in 1982, but that may be changing for the worse. While the number of mobile rigs under contract increased from 439 in January 1982, to 486 in March 1983, the fleet utilization rate declined from 100 percent to 88 percent. Two major markets, the North Sea and Southeast Asia, experienced increases in active rigs but both also had far greater growth in the number of available rigs. Contractors who had foreseen the oversupply in the Gulf of Mexico moved their rigs to the international market, in some cases only to see them sit idle. With new rigs being delivered every day, one can legitimately ask whether the international market will get far worse than that of the Gulf of Mexico. Some 53 more rigs are to be delivered into the international market, but only 17 do not have contracts. The unanswered question this year is whether these new rigs with contracts will displace presently working rigs, forcing them to become idle.

Despite the falling utilization rate, certain markets in the international area are active and of great interest to contractors. Since the British government announced new tax changes which greatly improve the economics of small fields the outlook for the North Sea is better today than it was several weeks ago. India, with the backing of loans from the World Bank, is seeking to step up its offshore exploration and development activity. China has yet to award its new offshore concessions, which will most likely require rapid exploration efforts. Finally, Eastern Canada will become more active, especially if the federal and provincial governments get their political differences resolved. The rest of the world will be about status quo. The efforts of many countries to continue or accelerate their offshore activity will be circumscribed by financial problems resulting from falling oil prices.

Marine construction activity is well fixed for the year because

of the lead time required to begin projects and the problems with weather windows in installation work. Activity in 1984 may increase as some marginal fields in the United Kingdom's North Sea move into the development phase. The brightest spot for the marine construction industry in 1983 will be Southeast Asia. Last year this market saw a total of 77 platform installations. This year that total may reach 98, depending on actual installation dates. Within this geographic market, the hot spot is India, which currently has 57 platforms in various stages of planning, design, construction and installation.

Prospects for the boat industry internationally are better than in the Gulf of Mexico, as drilling continues to move into more hostile environments requiring larger horsepower boats. Since these high horsepower boats make up a smaller proportion of the fleet, their increased use should produce higher contract rates. The diving market will continue to depend on the level of drilling, as support work for marine construction will be weak. A growing opportunity for the diving industry is in repair and maintenance of existing platforms.

If 1983 is going to be the roughest year yet for the offshore industry, is there a silver lining out there? We believe better times do lie ahead for the industry beginning in 1984 and continuing into 1985. The question is can companies hold out that long?

The 5-year lease-sale schedule of the Reagan Administration is producing the first areawide sales. In the Gulf of Mexico, these sales are particularly important since they represent the first time oil companies will be allowed to spend money where they want, rather than where the government says. The three Gulf sales this year may represent the last chance for the oil industry to get prime exploratory acreage in a known producing province. Much of the acreage that will draw attention was previously leased and relinquished. Much of this acreage was explored before improvements were made in seismic technology, which have proven very helpful in increasing wildcat success rates in the Gulf of Mexico during the past 5 years. The lease sale program also calls for a number of sales off the coast of Alaska. Late last year the petroleum industry spent \$2 billion on acreage in the Diapir Field near Prudhoe Bay. The possibility of finding oil was calculated to be 99 percent. While the other areas off Alaska's coast will probably not be rated as high, they will be very attractive, albeit expensive, areas to explore. Recent discoveries off the coast of California, coupled with announced expansion plans in existing producing fields there, will inject some demand into a weak domestic drilling and marine construction market. However, much of this stimulus will not come until 1984.

The recent changes in British tax policies have had the effect of reducing the commercial threshold for offshore fields in the North Sea to about 150 million to 160 million barrels of recoverable reserves. The impact of this reduction could result in the development of an additional 30 fields in the United Kingdom's sector of the North Sea between 1983 and 1990. Shell has announced a commitment to spend \$500 million to \$600 million each year for the remainder of the decade with a like amount to be spent by Esso.

Various other countries around the world are granting financial

concessions either in new lease terms or in existing concessions aimed at stimulating exploration and development. Keep in mind that changes in tax policies can more than offset a drop in the price of oil. These actions all help the outlook for the offshore industry.

Turning to the 1985 rig market, based on our study and assuming the following parameters, all the rigs in the mobile rig fleet can be working at profitable day rates by the end of that year. Our parameters include an oil price in 1980 dollars of \$28.46 per barrel and a U.S. natural gas price in real terms of \$1.86 per million cubic feet. We further assume that oil and gas production will be down 10 percent from 1980 levels and that the proportion of wellhead revenues going into new drilling remains constant at 20 percent while the percentage going to offshore drilling increases from 20 percent to 30 percent. If this occurs the petroleum industry would have available between \$10.8 billion and \$12 billion to spend on mobile rig hires. The cost to operate the fleet on a profitable basis, defined as a day rate which produces a pre-tax cash flow return on capital of between 12 percent and 15 percent, or about a 7- to 8-year payout of the rig, will be about \$11 billion. This cost estimate assumes no additions to the fleet beyond those scheduled, which appears a logical assumption. In fact some of the rigs scheduled for 1984 and 1985 delivery are probably going to be cancelled. Thus, full employment of the fleet is within the range of projected fleet expenditures.

In 1984, drilling contractors can expect continued under utilization of the fleet. However, the utilization rate should steadily improve through the year. Day rates will continue to be depressed through the year. True profitability will not return to the offshore rig market until utilization reaches into the 90 to 95 percent range. That won't occur until some time in 1985. When this happens, the first new rig orders will be seen.

What about the rest of the marine industry? Just as day follows night, its health and future prospects will begin to improve as the rig market gets better. Those companies providing services to drilling rigs will get better quicker. Those companies providing capital goods will be the last to heal.

There is little doubt that if our scenario is correct the next growth spurt for the offshore industry will begin in late 1985 or early 1986. Where will the bright spots be then? Primarily in the same markets and geographic areas where drilling is taking place now. For those in the marine industry the passage from here to there will require nerves of steel, an entrepreneurial flair, a sound financial condition and a solid game plan. For the first time in a decade, management and planning, rather than the strength of the market, will determine the success of a company. Through a critical evaluation of your company's and your competitors' strengths and weaknesses, along with good market research and analysis, you can get to the other side of this valley.

Better times do lie ahead! And those companies that prepare and plan now will be the leaders in the next cycle.

"Outlook for Offshore/Marine Equipment Operators"

DAMON B. BANKSTON, Tidewater, Inc.

I.R. FOSTER, JR., McDermott Marine Engineering, McDermott, Inc.

JOHN R. HUFF, Western Oceanic, Inc.

J.WESLEY ROGERS, Oceaneering International, Inc.

DAMON B. BANKSTON, Tidewater, Inc.

Contrary to indications of an improving U.S. economy, our marine services segment continues to experience declining revenues as a result of depressed conditions in the U.S. Gulf of Mexico and a deteriorating rate structure and utilization factor in both the domestic and foreign marketplace. During fiscal year 1982, we re-deployed many of our vessels from the domestic market to foreign areas, but now the foreign areas are also suffering adverse industry conditions. A slowdown in foreign drilling activity has created an oversupply of marine equipment and caused downward pressure on rate structures.

Bright spots on the horizon include the accelerated schedule of lease sales. The most important one, on May 25, will cover some 47 million acres in the Gulf of Mexico. There will also be two Gulf sales in August and November, with others scheduled offshore Alaska, and two on the U.S. East Coast this year. We expect the U.S. Gulf market also will slowly improve as activity picks up following the lease sales. There are, however, clouds on the horizon in connection with these sales. Recent court activity surrounding lease sale #52 on the Grand Banks is a prime example. It would seem the surplus of oil has given new life to environmentalists' efforts to shut down offshore drilling, so we may expect accelerated court action aimed at slowing down drilling in this and other areas. It would also seem that the lessons of the Arab oil embargo of 1973-1974 have gone unheeded.

It appears that various vessel types and general designs will remain virtually the same over the next decade, with minor modifications, such as specially designed tanks and new pumping systems. We will begin to see some special vessel design modifications and new service additions to the marine business to accommodate an industry which has expanded to the very edge of the continental shelf in many areas of the world. As this development matures basic changes will be made in support vessel hull design.

We are frequently asked about the possibility of using uniquely designed craft as support vessels. I've seen no design which is currently economically feasible, but maybe these sophisticated craft will come into their own during the next 25 years. Recently, semisubmersible support vessels have been built, and others are on the drawing boards, which are equipped with cranes and other gear capable of providing complete platform construction support offshore. The market, while rather limited now, should fully develop in the future, particularly for application in the harsher operating environments where there is need to provide a more stable work platform. Mining in the ocean environment will become a viable prospect for offshore support companies. For this to develop more fully, the industry will need innovative vessels, capable

of providing the gear necessary to mine and otherwise process precious seabed minerals.

Several problems, in our opinion, significantly contributed to the overbuilt situation in the industry. The Maritime Administration's (MarAd) Title XI Financing Program, as applied to marine-related oil-field equipment, was originally designed to provide federally-guaranteed financing to breathe life into the obsolete, traditional U.S. Merchant Fleet; to provide work for our shipyards, and to enhance our national defense posture. This in itself was good, but through liberal interpretation of the Act, it was extended to boats serving the international oilfield. This scenario began about 10 years ago and the results are not entirely beneficial. The federally-backed loan guarantees served some companies well, but also opened the door for speculators, among others, to come into the offshore service business, usually as limited partners. They wanted to shelter tax dollars at no risk. As a result, in excess of 200 vessels per year were added to the worldwide support fleet in 1979, 1980 and 1981 and, in the aggregate, have greatly contributed to the current vessel oversupply. We are not opposed to creative financing, but we have difficulty understanding the logic of infusions of government financing that artificially over stimulate a once healthy industry into rapid overgrowth.

In the makeup of this business there are at least two basic ingredients: "equity and love of the business." In cases of loan default, MarAd requests bondholders to defer collection of principal while paying interest. This has served to keep poorly financed, highly leveraged companies afloat. MarAd is not, however, lending operating capital to the vessel owners. This procedure strongly suggests that an operator, in this kind of situation, may defer or give little heed to vessel maintenance. The inevitable results are breakdowns, poor service and a degradation of safety standards. Even today, there is still a program of government loan guarantees; but, perhaps, in recognition of a pending problem and regard for the tax-paying public, the thrust of the original program has shifted. Dispensation of loan guarantees has slowed and instead of an 87-1/2 percent guaranteed loan, it is now 75 percent. Furthermore, the investment tax credit is now limited to the investment "at risk." There are few new vessels scheduled because overwhelming indicators show the market is overtonnaged. We can only hope that in its wisdom, Congress will look at the situation and build safeguards, perhaps a system of checks and balances whereby the pulse of the industry can be taken at frequent intervals and decisions made based on true needs rather than on meaningless factors. We do not need more controls, but need to better use those in existence.

Financing in this industry remains a very special problem. At no time in our industry has the financial situation of some companies been more tenuous than it is today. Bankers play a key role. They will have to look longer, harder and more scrupulously than ever before to determine where and when to grant loans and credit extensions. They must make delicate decisions affecting companies that are poorly managed and under-capitalized.

Recently major oil and gas producers and drilling contractors have realized there is a need to perpetuate reliable, dependable offshore

support services, the kind provided by established, committed and experienced companies, which are in business for the long haul, not for a momentary tax advantage. Those firms render a real service in exchange for a reasonable profit.

There are a number of legislative and regulatory issues which concern boat operators. These issues are complex, serious and wide-ranging. On the regulatory front there are a multitude of new or pending regulations and rules - some originating at the International Maritime Organization (IMO) - others at various U.S. agencies. In some way, they all contribute to the high cost of doing business. To be aware of all these rules and regulations is a big order requiring commitment of people and resources. To remain passive, trusting to luck or the goodwill of regulators to produce regulations in the best interests of the industry and the public is foolhardy. The consequences of neglecting this facet of our business are potentially disastrous. Therefore, I recommend continued vigilance and extreme diligence by all concerned.

Experts believe that oil and gas in the offshore environment will not be depleted for a long time to come. So far, as we all know, there is not a single energy source that runs even a close second to the efficiency and cost effectiveness of oil and gas.

I.R. FOSTER, JR.
McDermott Marine Engineering, McDermott, Inc.

I wish I could assure you that your economic future will be bright, but I regret to say that the immediate future of the offshore marine construction industry is very dim. In most areas of the world construction will be fiercely competitive for approximately 24 months, maybe more. In the Gulf of Mexico the workload will remain at the same level as last year, or perhaps even decline.

Right now oil prices are not stable. When energy was scarce a few years ago, the OPEC nations sold oil above their own posted prices. Now, because of surpluses, they are underselling each other to maintain volume. They have not acted as a true cartel. The marketplace is governing prices, not OPEC. And what we are seeing is a balancing of consumption and production. The drop in oil prices around the world has altered the operating budgets of producers. Cash flows have been reduced drastically, and many exploration budgets were cut by 10 or even 20 percent last year. These same levels will probably be maintained this year. Only 65 percent of the mobile rigs in the Gulf of Mexico were working at the end of March, down from 72 percent in February. If there is no drilling, there are no new discoveries, and no construction. Offshore construction is in a tight, competitive market today, and we believe smaller exploration budgets will prolong these conditions until at least 1985. Construction companies will not see a drastic upswing in their market until existing excess oil stocks are depleted. But despite dropping oil prices, there will be some exploration and some development during the next 2 years but only at a level of 60 to 70 percent of that in years past.

For 30 years, the marine construction industry has gone in cycles -- a pattern of ups and downs. To prosper, one has to learn to use these cycles to advantage, to anticipate, and respond to them. At no time has that been more important than it is today. Given these conditions, all of us should have two fundamental objectives: first, to survive, and second, to be ready for the upturn that will eventually come.

The near-term picture is survival. As you know, an income statement contains the simple equation: revenue minus cost equals profit. Let's look at revenues. Even if you maintain your share of the market, and even if net prices for your work remain the same, you can expect only 60 to 70 percent of the business you did a couple of years ago. And with fierce competition you can be sure your unit prices will drop, so you can expect even smaller total revenues. Since your income will be substantially lower, in order to keep the equation somewhat balanced, you must cut your costs commensurate with these reduced revenues.

At McDermott, we are cutting costs to remain competitive. We have reduced the total number of employees on our payroll; we have frozen salaries worldwide; we have consolidated or eliminated operations that had become redundant in light of reduced business levels; and we have established a central control system to manage our major projects, from estimating and preparing proposals to monitoring and controlling finances when we are fortunate enough to obtain a project. Although most of these changes were painful initially, they are designed with one purpose in mind: to survive!

The picture is not all black. Many economists consider falling oil prices to be the harbinger of better times. Less expensive energy should aid industrial production. Traditionally, among industrial powers, as GNP rises, so does energy consumption. Lower energy prices should also help limit inflation, free consumer money for other goods, and lead to spending that could benefit the overall economy. In other words, if current lower energy prices persist, they may prime the pump of industrial recovery, leading to increased consumption and eventually to firmer oil prices. Ironically, if that happens without sufficient levels of drilling and development in the next 2 years, industrial nations could face another energy crisis by 1986 and we would be in a boom.

Don't look for any boom to be as bright as it has been in the past. We saw the automobile, electronics and steel industries lose jobs permanently during the last "recession." That same thing could happen in the oil field. Foreign competitors may block us out, not only in world markets, but also here at home. These competitors are getting smarter every day and some of our business may permanently shift to them.

When the boom comes, how well you recover will depend on how well you can expand from a low level of activity to a high level in a short period of time. This will impact both people and equipment. We're trying to keep as many experienced personnel on board as we can so they will be available to train "green hands" quickly. We've stacked older, less efficient equipment, and have upgraded the capacity of those vessels we feel will be most in demand during the next boom. Your planning

process now should aim at keeping as many of your experienced people as possible, eliminating outdated equipment, upgrading popular equipment and recognizing the possible permanent loss of business to foreign competitors. This present slump is yet another test of planning skills, ingenuity, perseverance, and luck.

JOHN R. HUFF, Western Oceanic, Inc.

Offshore drilling industry business is based almost entirely on oil and gas company budget determinations, which generally reflect their short- and long-term inventory requirements, i.e., the immediate need for products or the long-term need for crude and/or gas reserves. The price of oil is the single most important ingredient in the oil company budget. The price of oil provides the foundation for an oil company's cash flow and provides clues as to how the company should spend its money. When the price of oil is expected to increase, more emphasis is placed on exploration and production budgets.

Western Oceanic thinks the price of crude oil will be about \$40 per barrel by 1986. The results of this price increase would be an increase in worldwide offshore drilling rig utilization by the end of 1983 to the low to mid 80 percent range, by the end of 1984 to the 90 percent range and by the end of 1985 to the mid 90 percent range.

Recently there have been predictions of shakeouts in the offshore drilling industry. Out of the 60 tax-sheltered offshore drilling rigs built, about 30 are currently working. These rigs are not a problem for the industry. However government inconsistency has been a problem. The U.S. government's leasing policy forced U.S. operators and rigs into foreign areas in the late 1960s. Many of the major opportunities for outer continental shelf (OCS) drilling activity mentioned today were considered 15 years ago. The OCS leases to be offered over the next 5 years (230 million acres) will cover the largest area in the history of OCS drilling. This will generate a tremendous demand stimulus for offshore drilling and will put many rigs to work. Hopefully this demand will generate enough work to create profitability in the industry again. Today with the low utilization of rigs, many rigs are operating at or below cost. These inconsistent economic policies are not limited to the U.S. government. The North Sea area was affected by the United Kingdom's taxing policy. The United Kingdom has reversed this policy now and has given operators in that area \$1.2 billion in tax relief over the next 4 years. Eastern Canada has also provided incentives for national Canadian companies to explore frontier areas.

Regulatory problems and trends will be affected some by the outcome of the Department of Transportation's (U.S. Coast Guard) investigation of the Ocean Ranger catastrophe. Preliminary findings of the investigation indicate that the training of the Ocean Ranger crew was insufficient. This should spawn new training requirements. Many major companies have already seen the need for this training and have facilities for this. But, industrywide it will be a problem. Another area of concern is the Norwegian Det Norske Veritas(DNV), which has grown into a dominate force in the international offshore industry, pushing into

manufacturing standards for drilling equipment. This has happened without coordination with the American Petroleum Institute (API) or other knowledgeable drilling industry professional societies or drilling industry standard-bearers.

Technological problems, developments and trends will be tied to developments in frontier areas like Alaska, Eastern Canada and the North Sea. These harsh-environment areas will produce a need for new technology in deep-water drilling; cold weather materials; metallurgy; drilling technology (such as measurement-while-drilling devices and downhole drilling motors) and safety equipment, including crane safety appliances and communications systems.

Current and expected labor availability problems do not exist when 20 percent of the worldwide drilling rig fleet is stacked. There has never been an industry shortage of people, only of experienced people. Training programs have not been able to keep pace during "boom" times, but with 2 years of lead time ahead before another upsurge, the more progressive companies should be in good shape to provide experienced people for their rigs. The industry has, however, not done a good job in the employee productivity area. Labor costs increased over 300 percent in the past 8 years, between 1975 and 1982, due mostly to fierce competition between firms for experienced personnel. This problem will need to be studied carefully in future.

Considering current Gulf of Mexico dayrates are less than cash operating costs, companies without sufficient capital are bound to suffer. Companies (some with the aid and subsidy of the their banker) will face liquidity problems as best they can. Some of these undercapitalized firms will have serious financial problems unless they are subsidized. Classical economic theory would point to consolidations; perhaps this will happen. Two-thirds of our present competitors are less than 6 years old.

J. WESLEY ROGERS, Oceaneering International, Inc.

The underwater services market is primarily tied to the offshore oil and gas industry worldwide in all phases of the offshore development cycle: offshore drilling and exploration, pipeline and jacket installation and production facilities inspection and repair. We work in different areas of the world in different parts of the offshore development cycle. With services throughout different phases of the industry, it is difficult to measure supply in terms of the number of divers, saturation systems, remote vehicles and other equipment.

There probably has never been a customer who has experienced a shortage of underwater services. Competition in underwater services has been very tough. This overcompetitive situation will force a number of companies out of business particularly in the Gulf of Mexico where low capital requirements and low technology requirements attract a number of smaller, undercapitalized companies. The oil companies are beginning to favor well-established firms that will continue to provide services to the industry over the long term.

The biggest problem to come out of today's oversupply will be a shortage of qualified personnel. Wages for underwater services' personnel are about the same as they were 5 years ago and, as a result, many qualified personnel have gone to other industries - like the offshore drilling industry - for more pay. Problems are surfacing in the industry concerning unionization of personnel in some parts of the world.

On the demand side of the market equation, the underwater services industry is a support industry for oil companies and offshore drilling and construction firms. Therefore we look to these industries for market predictions and information. In the exploration and rig diving phase, underwater services are provided primarily on floating equipment like drill ships and semisubmersibles. The utilization rate of this equipment is not as important as the number of rigs working and the number of days they operate. Saturation diving is the most common support tool for offshore rigs. The Gulf of Mexico has primarily been a jackup rig market and, as a result, has never been a very large market for diving services in the exploration phase. Deep-water diving services are steadily increasing in the Gulf of Mexico with more deep-water installation. Last year more deep-water installations were put in the Gulf of Mexico than in any other part of the world. The west coast of the United States, Alaska and the east coast of Canada are deep-water environments with a need for saturation diving equipment and atmospheric diving systems.

In the construction phase the amount of work moves from one geographical area to another year by year. The market shifted from Mexico in 1982 to a large market in Norway in 1983. The use of remote control vehicles to support the diver in deep-water environments is one of the more promising technical areas for the industry.

In the production phase underwater services offer ongoing maintenance of structures including inspection and maintenance and repair services of subsea equipment and platform structures. Atmospheric dive suits are ideally suited for maintenance of offshore structures because of the work schedule the diver can keep without decompression time. This can also be enhanced by the use of remote control vehicles to do simple maintenance work and carry equipment to and from work sites on the ocean bottom. In different parts of the world there are varied criteria for maintenance, inspection and repair. Some areas, like the North Sea, have very precise inspection standards. In the Gulf of Mexico there are no standards. Oil company standards also dictate a wide variety of practices. Some companies believe that preventative maintenance and inspection is cost effective, while others wait until something breaks to fix it. Since company cash flows have been reduced, more companies are adopting the latter attitude. More platforms are being installed each year and fewer being replaced, resulting in a need for more maintenance on older platforms. In this production phase the market is growing for inspection and maintenance and repair underwater services. The real growth in this market is outside the Gulf of Mexico.

Another trend is the use of specially designed diving support boats equipped to handle a variety of underwater service equipment and personnel. At this time expensive support boats are not cost effective, but they should be in the future.

From an industry viewpoint it is difficult to be optimistic about the future worldwide market for underwater services when the demand for rig support services is relatively flat with a lot of pricing pressure. The construction phase market should remain relatively flat. The real growth, possibly as much as 20 percent this year, should occur in the maintenance, inspection and repair market.

"Future Offshore Exploration and Production
-- A Producer's View"

D.S. "SCOTTY" HOLLAND, Pennzoil Exploration and Production Co.

Many skeptics are asking if there is a future in offshore exploration and production. My answer is a resounding "yes." Even with today's depressed level of activity, more than 570 offshore rigs are drilling worldwide with more than 200 of them off U.S. shores. Worldwide offshore drilling rig activity stands at a little less than 90 percent of what it was at this time last year; but, compared with the onshore U.S. rig count, this sounds like a boom! More than 50 percent of last year's total of onshore U.S. rigs are idled.

Offshore production is becoming more and more important. Almost 25 percent of the world's oil production is offshore; natural gas production is approaching 20 percent of the world's total; and we've only begun to explore offshore waters. In the United States, only a little over 1 percent (13 million acres) of the outer continental shelf (OCS) is under lease and a large segment has not even been evaluated except with a few Continental Offshore Stratigraphic Test wells. Most major discoveries of the next several years will be offshore. Our problem is that opportunities for exploration and production offshore far exceed the financial resources we have available. The weak market for hydrocarbons has created an air of uncertainty that doesn't help the problem.

To counteract uncertainty, producers are taking an even more studied approach to their exploration and production decisions. Four key factors are considered in making the "how," "when" and "where" decisions for offshore participation. These are: the geologic potential; the availability of acreage; the technology needed to evaluate, explore and develop a prospect; and the overall economics of the venture.

Prime offshore areas where geologic conditions exist for high potential prospects are offshore Alaska and California, the Gulf of Mexico, the North Atlantic area, and offshore China. The ocean frontiers, according to conservative estimates, contain approximately 30 percent of the total hydrocarbon resources of the world and probably more than 90 percent of those oil and gas deposits remain undiscovered. U.S. offshore reserve estimates give some indication of the amounts involved. The U.S. Geological Survey estimates that undiscovered, recoverable offshore U.S. reserves total 19 billion barrels of oil and almost 120 trillion cubic feet of gas. In the Gulf of Mexico alone they estimate undiscovered, recoverable reserves of 6.5 billion barrels of oil and 72 trillion cubic feet of natural gas.

The worldwide opportunities seem almost unlimited. The industry is held back primarily by political considerations and costs associated

with exploring in remote locations. Most producers try to be selective in their leasing activities and look for ways to expand their exploration opportunities while spreading the risk of discovery over many basins.

For examples of the types of plays being made in these offshore basins let's look at offshore California and the Beaufort Sea. The area off southern California's coast near Santa Barbara has an anticlinal trap on the upthrown side of a northwest-southeast trending fault. It produces from the highly-fractured Monterey formation. This area promises to be a hot spot for the industry over the next several years. In the last few months several discoveries from the Point Arguello Field area northward into the Santa Maria Basin have been reported. In the Beaufort Sea the industry spent more than \$2 billion in OCS lease sale #71. Almost \$1.35 billion was spent on 11 tracts in the "Harrison Bay High." This feature is a combination structural and stratigraphic trap on trend and a "look alike" to the prolific Prudhoe Bay Field. Prudhoe Bay has estimated recoverable reserves of more than 10 billion barrels of oil.

Offshore Alaska has its own special problems including high costs and long lead times. Most exploratory drilling in the Beaufort Sea will need to be from man-made islands.

Another factor is the availability of acreage for lease. For producers, the next few years offer an unusually good opportunity to secure prime U.S. offshore acreage. More than 198 million acres are scheduled to be opened for bidding this year alone in ten different OCS lease sales. In past sales only 52.5 million acres have been offered in 65 lease sales.

The third key factor is technology. Technology has three major categories -- seismic, drilling and production. Offshore, high-quality seismic data is an absolute essential. In geophysics, we are witnessing a virtual explosion in technology for improved data collection and processing. The advent of microcomputers on the one hand and supercomputers, like the Cray, on the other will continue to impact this geophysical technology. Our ability to manipulate, view and interpret large volumes of data (such as that available from 3D seismic surveys) will require improved interactive interpretation techniques that are being developed. Tremendous advances have been made in drilling and platform design, well control, well bore maintenance and deep-water drilling techniques. Similar technological advances also are being made in the production area with improved reservoir simulation, reserve management and storage, and transportation systems.

The fourth key factor -- economics -- presents the greatest current constraint on offshore exploration and development. With falling cash flows due to lower product price and gas curtailment, each project is subjected to tighter and tighter controls on capital expenditures. In the oil and gas business, the rate of return is controlled by the cost of development, product price-produced volumes, and timing from investment to depletion. Development costs can be held to acceptable levels by the prudent control and use of the best technology and services available. Product prices will vary but market forces will eventually

determine the weighted average. Timing can be influenced somewhat by operator and consumer demand, but the volumes of hydrocarbons produced are directly tied to the ability of the scientist to use high technology to increase the rate of discovery. This increase in discovery rate has the most impact on increasing the rate of return of any given program.

Economic recovery has begun in the United States, but will be moderate by historical standards. All sectors of the economy should be participating in the recovery by 1984. However, the recovery is not expected to be as fast in the oil industry as in other areas because of depressed crude prices. These prices are expected to increase only moderately over the next several years. Domestic natural gas consumption should continue to be curtailed at current levels for approximately 1 year with consumption declining marginally. If natural gas is deregulated, this situation could change. A fully deregulated industry would encourage exploration in the United States, increasing domestic employment and helping ensure a secure supply of this clean fuel and feedstock source.

The price of oil is down, but stabilizing, and the demand for natural gas is severely cut back, but will rise in the future. We must look past the immediate market for what will come inevitably -- a need and demand for these vital resources. Producers are ready and willing to move when cash becomes available. Technical resources are plentiful and will be available when we return to the high level of activity we once enjoyed.

"Outlook for Marine Transportation Industries and
Offshore/Marine Equipment Builders and Repairers"

FRANK J. IAROSSEI, Exxon Shipping Company
LESTER V. MARTIN, Todd Shipyards Corporation, Galveston Division
R. JERE SHOPP, Halter Marine, Inc.

FRANK J. IAROSSEI, Exxon Shipping Company

The Gulf coast and upriver barge business has been directly impacted by the sluggish worldwide economy because it depends primarily on movements of basic materials such as coal, petroleum, grain and chemicals. More than 30 percent of the tank barge fleet and nearly 30 percent of the dry bulk barge fleet is idle. Two construction yards have been shut down, and others may soon follow suit. Operating margins for barge operators are razor thin and likely to remain so until requirements more nearly approach available capacity. Grain and coal barge demand should grow as worldwide economic conditions improve. Chemicals and coal movements should also increase as the domestic economy improves. However, the outlook for petroleum barge movements is not as good. Demand is not expected to increase significantly, even with an improving economy, and pipelines have spare capacity readily available to handle any increase that does occur. With respect to Gulf coast and upriver barging, it will be some time before the demand for coal, grain, and chemical movements match the barge capacity now available; with regard to tank barges, existing capacity exceeds even the most optimistic projection. Unfortunately, this means the painful adjustments

now occurring within the barge industry will continue for some time.

The international tanker market has been in a protracted slump since the mid-1970s. Thirty to fifty percent of the world's tanker fleet has been idle or otherwise underutilized during the past 7 to 8 years, and the outlook is not expected to improve substantially during the remainder of this decade. Since U.S. construction costs remain two to three times that of foreign construction costs, and U.S. crew costs are three to four times that of foreign crews, it's difficult to envision U.S. flag tankers competing in this environment. With the expected decline in tanker requirements for the strategic petroleum reserve, it's safe to assume that U.S. flag tankers will not have a meaningful role in future international trade unless mandated otherwise by federal legislation.

The Jones Act tanker industry, made up of tankers operating in domestic trades protected by the Jones Act, is in a period of rapid transition. The 1970s was a period of relative growth for the Jones Act fleet. In that decade, while the number of vessels grew by a modest 10 percent, deadweight tonnage more than doubled, from 7.4 million to 15.8 million DWT, as larger tankers suitable for Alaskan crude movements were built and older and smaller vessels were retired. The scrapping of older tankers has continued at an accelerated pace and the last commercial contract for a new tanker was concluded in April 1981. Seventy-six Jones Act tankers are in crude service, primarily moving Alaskan north slope crude. More than half of the Jones Act tanker tonnage is associated with this trade. By contrast, the largest number of tankers (112 in total) are employed in Jones Act product movements. At the end of March, there were about 30 tankers in lay up.

To properly assess future requirements for U.S. flag tankers in domestic trade, one must understand two fundamental changes which have taken place in the U.S. petroleum industry during the past 5 years. The first change resulted in a significant decrease in tanker movements between our major refining and crude oil centers along the Gulf coast and our major petroleum product markets along the east coast. In 1971, domestic crude production along the Gulf coast began to decline, and with it the demand for U.S. tankers to move excess Gulf coast crude to east coast refineries. Today this trade, once over 25 percent of our tanker movements, has essentially disappeared. The second component of the Gulf-to-east-coast tanker business began a rapid decline in the late 1970s when the overall demand for petroleum products decreased while product pipelines continued to expand. Petroleum analysts now project product demand in 1990 and beyond will be essentially the same as it is today. The tanker demand prompted by the need to move petroleum cargoes from the Gulf to east coast is less than 50 percent of what it was 20 years ago and will probably continue to decline in the foreseeable future as product pipelines are extended as far north as Boston and as far south as Miami.

The second fundamental change involves the emergence of the U.S. west coast as an area of crude surplus. From the standpoint of the U.S. tanker industry, the completion of the trans-Alaska pipeline system in 1977 could not have come at a more opportune time. By 1978 Alaskan north slope (ANS) production exceeded the ability of west coast markets

to absorb it. Substantial tonnage was needed to move ANS crude to the Gulf and east coasts at the very time the market for product tankers was declining. Nineteen Jones Act tankers with deadweights in excess of 100,000 tons were built during the 1970s to serve the Valdez trade. Thus the rapid increase in requirements to move surplus west coast crude to the Gulf and east coasts essentially offset the negative impact of the decline in east coast product trades. Valdez trader tonnage demand increased to about 300 T-2 equivalents by 1982. Reasonable projections indicate that taps will probably operate near capacity until the late 1980s, when Prudhoe Bay production is expected to begin its natural decline. The outlook for tankers in the late 1980s is one of diminishing requirements with no new building anticipated for Valdez service for the remainder of this decade. West coast crude movements, which now account for nearly 60 percent of U.S. flag tanker tonnage, should play an even more dominant role in the 1990s.

The future of the U.S. tanker fleet rests primarily with the petroleum industry's search for oil reserves off the coasts of California and Alaska. Recent estimates for the west coast put the offshore oil resource potential of this region at 3.7 billion barrels, two-thirds of it off southern California. New production from reserves off the southern California coast is also farthest along in terms of resource development. Production from the first of these deep-water fields began 2 years ago. The environmental sensitivity of the Santa Barbara Channel location required development of a unique production, storage and transportation system. It was the first designed for release of hydrocarbon vapors as well as liquids. The platform, located approximately 4 miles off the California coast, is connected to the Offshore Storage and Treating (OS&T) vessel via a single anchor leg mooring. Five existing vessels in the 40,000- to 50,000-ton range were modified to enable them to hook up to the OS&T and offtake the crude for shipment via the Panama Canal to Exxon's Baytown, Texas, refinery. Twenty-five million barrels of crude oil have been transported since the project started.

The disposition of future offshore California production is uncertain. With at least 300,000 barrels per day of new production anticipated by 1990, an offshore pipeline system connected to an onshore terminal may be the most economic solution. What is most important to the tanker industry, however, is the disposition of the crude. Three alternatives are under study: transportation via a newly proposed pipeline system connecting to Midland, Texas; transportation by tanker via Panama to Gulf Coast refining centers, and substitution of this offshore California crude for Alaskan crude now refined on the West Coast, thus increasing tanker movements of Alaskan crude via Panama. The impact on tanker requirements of the second and third alternatives could be significant -- over 75 T-2 equivalents in capacity to move an additional 300,000 barrels per day via Panama to the Gulf and East coasts. Whether terminalled onshore or offshore, stringent environmental standards undoubtedly will have to be met. These environmental requirements, coupled with the pressing need in our industry for increased operating efficiency through lower manning levels and reduced fuel consumption, could promote the construction of a class of diesel-powered Panama tankers far superior to vessels currently in service.

Additional opportunities for water movement of crude may also arise

in the offshore Gulf of Mexico where the undiscovered resource potential is estimated at more than 6 billion barrels of oil and 70 trillion cubic feet of gas. As reserves are found further offshore, particularly at depths between 1,000 and 2,000 feet, crude or gas from submerged production system wells will most likely be produced through a riser into a stationary tanker. Alternately, crude or gas could be pumped down the riser to a pipeline running to shore. The economic choice between shuttle tankers and pipelines will be determined by such factors as the volumes involved, location, water depth, relative investments and operating costs. Since the distances are relatively short, vessel requirements will not be large. Nonetheless, any additional demand will be welcomed by the tanker industry.

By far the largest source of yet undiscovered petroleum reserves lies in and offshore the coast of Alaska. The estimated oil resource potential of onshore fields totals 6.5 billion barrels while the potential of offshore basins in this figure totals nearly 19 billion barrels, most of it located in the Bering and Beaufort seas to the west and north of Alaska. The resource estimate for the entire Beaufort Sea area is 9.5 billion barrels. The estimate for all reserves from all fields yet to be found on the north slope adjacent to Prudhoe Bay is an additional 6.5 billion barrels. New production from these two areas is not likely to commence until some years after Prudhoe Bay production decline begins. Since new reserve additions will, for the most part, be replacing depleted north slope reserves, the impact on tanker requirements will be limited unless these reserve estimates turn out to be very conservative. Bering Sea development would be entirely dependent on new tankers to move any crude produced. Movements from the Navarin, St. George and North Aleutian basins may be possible using ice-strengthened tankers, while movements from the St. Lawrence and Norton basins will probably require icebreaking tankers. As one might expect, the critical variable in the design of the logistics system as well as specific vessels will be ice conditions.

The challenge will be to find the best combination of vessels and terminals for moving production from the various Bering Sea fields to their ultimate market. Before we can define the optimum logistics system, a number of questions need to be answered:

1. Will the crude production be stored at a centralized shore terminal or at offshore terminals over the production sites?
2. Will ice-capable tankers move the crude from the production terminal directly to the lower 48 states, or will an ice-free transshipping terminal be built enabling conventional tankers to complete the long distance leg?
3. Will the crude be shipped to California overland by pipeline, or via Panama to the Gulf and east coasts?

The choice between a centrally-located, onshore terminal and offshore storage at the production site will be influenced by the location and dispersion of the reserves, the suitability of shore locations, and the comparative ice conditions likely to be encountered. Most important, perhaps, are the comparative investment and operating costs for vessels

capable of Arctic and sub-Arctic service. An icebreaking tanker capable of operating in the northern portion of the Bering Sea may cost three times as much as a conventional tanker to build and more than twice as much to operate.

Requirements for Jones Act movements of petroleum and chemical products are likely to continue their global downward trend. The remaining fleet is almost entirely dependent on Alaskan north slope crude movements, the volume of which is also likely to decline in the late 1980s. In the 1990s, tonnage levels will be maintained only if significant new discoveries occur in areas adjacent to Prudhoe Bay, and in the high-potential Bering Sea region.

LESTER V. MARTIN, Todd Shipyards Corporation, Galveston Division

It is apparent that shipyards and their related base have, in fact, deteriorated. The maintenance or retention of the shipyard base is no longer, even to a small degree, something which can be controlled by those of us in the industry. In fact, our control over the existence or nonexistence of this base is near zero. For example, if the Reagan Administration decides to propose, and the Congress decides to extend the so-called foreign-building option for subsidized operators and to remove the requirement for a 50 percent ad valorem duty on nonemergency foreign repairs of U.S. flag ships, our possible U.S. commercial market will be zero. How much worse can circumstances get?

Specifically the depressed situation many Gulf of Mexico shipyards find themselves in seems to have happened so suddenly that we were taken completely by surprise. 1982 began on such a bright and promising note; the Gulf coast was humming with activity. In our industry new construction contracts, ship and barge repair jobs, as well as oil rig and drill ship work, were abundant. The prognosis for our industry from the aggregate impact of these favorable market conditions was continued significant increases in production man-hours, efficient work forces stabilized at high manpower levels, strong backlogs of work, increased dry-dock revenues and profitable returns on investment. The first 6 months of 1982 almost lived up to these expectations. By the fall, however, there were many dark clouds on the horizon. The bottom had fallen out of the drill rig business during the summer. New construction work of all kinds had nearly ceased. The marine industry worldwide was rapidly facing hard times; many ships had been laid up or scrapped. The Gulf coast, immune up to this point to the national downturn in business, began to feel deeply the effects of the recession for the first time. Competition for all types of ship repair work was becoming very fierce; prices were getting cheaper and cheaper for more and more work. In January and February 1983, opportunities for ship repair work did increase moderately, albeit at prices at break-even levels at best. This unhealthy market condition was due to the intense competition that had developed among shipyards along the east and Gulf coasts as the volume of available work continued to decline. Barge building and ship conversion opportunities still remained near zero.

Unfortunately, the shipyard workload for the 1980s does not look

very promising, but we in the shipyard industry neither cry "poverty" nor seek sympathy. The simple fact is that the oil glut and the lack of offshore exploration and development is hurting the shipyards as much as it is hurting the business of many others in the industry. The oil has slowed and with it the construction and repair of oil-related vessels and general cargo vessels as well. Those few ships being built are being constructed in Korea, Japan and other foreign countries. Capital expense programs and heavy maintenance work on ships are being deferred. These developments have forced a significant reduction in shipyard forces and a layoff of highly trained, experienced workers. The number of private shipyard workers in the United States dropped from 141,000 in January 1981 to 124,000 in July 1982 with further layoffs expected in 1983. Unfortunately, between now and 1985 more shipyards, large and small, may be forced to close their doors and a great number of the trained workmen who work in them may have to look elsewhere to practice their expertise. Everyone in industry knows the hiring and subsequent layoffs of production workers, engineers and experienced management employees is a most damaging consequence with respect to cost efficiency and productivity. These are the very elements our marine industry desperately needs to produce ships on time, at reasonable costs and of high quality. Each shipyard closing and/or major reduction of labor represents a loss of a cohesive, productive and irreplaceable work force of significant value to the U.S. economy and its industrial base. Each subsequent startup is a wasteful and time-consuming process, the cost of which is ultimately borne by our consumers.

The business appraisal for the Todd Galveston plant for 1983, at least, is that we expect it to be representative of a traditional ship repair year. It is typified by the last 6 months of 1982 and the following scenario: numerous peaks and valleys in workloads and manning levels; generally little or no backlog of work; intense competition for repair jobs; minimum profits on work; bid jobs the principal source of work available; and very few, new construction or major oil patch projects, if any. We feel this appraisal will hold true for practically all shipyards on the east and Gulf coasts and probably throughout most of Europe. We are hopeful that some new construction contracts, drill rig work or conversion opportunities will come to the market during the year. But we are certain that, as in the case of the repair area, if any do, we will have to engage in fierce competitive pricing for a share of this business due to the depressed state of the national economy and, in particular, the marine and oil industries. We see diversification into Navy work as almost a necessity because of the uncertainty of obtaining an adequate volume of commercial repair and/or new construction work during 1983 and beyond. Should the medium- or long-term market potential of Navy work justify the capital expenditures that would be required, we would expect to be in a position to submit a responsive proposal to the Navy by the summer or fall of this year with any actual facility changes accomplished no later than the end of this year. As you might imagine, we would much rather remain in commercial activities entirely, but we may not have a choice in order to survive. We are all partners in survival and now may be the opportune time to think about upgrading rigs and fleets. Shipyard space is available, the prices are certainly right and the expertise is waiting.

The vessel market is at an all time low, in terms of the number of vessels tied up. The surplus started in the Gulf of Mexico and as operators moved vessels out of the Gulf, spread worldwide. Accordingly, day rates have tumbled to the point where it is almost as favorable to keep vessels tied up as to operate them.

The industry is reeling under the combined impact of three factors -- all unfavorable. 1) a decline in the worldwide offshore rig count; 2) a 2-year overproduction of vessels and 3) a continuing decline in the ratio of the number of vessels used to service a rig. These three factors produced a record surplus of vessels and this surplus has driven down rates as operators have sought employment at almost any price. The end result is that the operator has been hit by low utilization rates and low day rates, a murderous combination which has caused and will continue to cause the economic ruin of many operators worldwide. Although many financing agencies are keeping marginal operators afloat by foregoing interest and in some cases, principal, few, if any, will provide infusions of additional cash to pay bills. In my opinion, 1983 will see additional failures.

The obvious question is when will this market turn around? The opinion most expressed at the recent annual oil field services investment seminar sponsored by the New Orleans investment banking and brokerage firm of Howard, Weil, Labrousse, Friedrichs & Co. was that bids at the scheduled central Gulf lease sale, May 25, will provide a good indication of what short-term offshore drilling expenditures will be. Another key is whether newly set OPEC prices will be maintained. Until this uncertainty is removed, oil companies are going to be somewhat hesitant to commit to major new programs.

Large oil companies that operate offshore reinvest nearly all after-tax cash flow in facilities, exploration and production. Therefore, it would seem a decline from \$30 per barrel to \$25 might indicate a 1/6 decline in exploration. However, the big loser in the decline over this price range is the federal government because of the windfall profits tax. The economic break-even point for Gulf of Mexico oil is \$25 per barrel, so, in my opinion, the price uncertainty presently is a bigger negative influence on drilling than the price decline to date. When the majors begin to seek long-term contracts at these depressed rates, an upturn is in store. Unfortunately, no one has seen that point yet. There will be an upturn, but hardly to the overheated activity of 1981, 1982. No one knows when the upturn will come, but few suspect it before mid-1984.

Who is reckless enough to build boats in this depressed market? Unfortunately for the shipyards, the answer is "damn few to next to none." Moreover, the few vessels put out to bid in recent months, have drawn ridiculously low bids, in many cases, below the direct cost of the shipyards. It is hard to sell something under your direct cost and make up for it in volume. For a dying shipyard, such a practice provides upfront cash, although it usually hastens the business' demise. For a well-capitalized yard, it can provide something for its key employees to

do but doesn't make sense for long. Nobody is getting well on recent prices.

Supply and demand in an unsubsidized economy must soon be adjusted. Demand is not going to increase soon, so the supply, the shipyard capacity, must be sharply reduced. The backlog many shipyards had been living on is largely depleted now. Massive layoffs have been initiated in the industry and shipyard closings are underway. Some of these yards have been mothballed, not bankrupt or reorganized. Many others are just hanging on, their demise is imminent. Shipyards require money to keep going and more to start up once the construction volume ceases. In this market, few investors are willing to put capital into our industry.

We are experiencing by far the worst shakeout in our industry's history and we have been used to ups and downs. Historically, good times have spawned new shipyards and bad times have pruned the ranks, but never like this. The number of surviving shipyards will depend on how long it takes operators to start ordering vessels; but, if we go through 1984 without an upturn, there will be a sharp reduction in our industry. The survivors will be largely limited to the asset-rich companies, the diversified yards and, at the other end of the spectrum, the tiny yards with next-to-no overhead or debt.

Despite all this gloom, there are some bright spots. The bad news is that not everyone can participate in the bright spots. These bright spots are Arctic vessels, government contracts and contracts for replacement vessels, in that order. Unless American flag operators roll over and let foreign vessels in through an exemption to the Jones Act, there will be a demand in the next few years for American flag Arctic or hostile-environment vessels to support exploration and production in U.S. waters off Alaska. The seismic results in these areas are very promising and Sohio, Shell, Arco, Gulf and Exxon are planning to spend a bundle of money there.

Generally speaking, hostile-environment vessels have been a part of the industry that has gone to the Europeans for use in the northern reaches of the North Sea and, more recently, to Canadian yards producing European designs for work in Canadian waters. Icebreakers have been the specialty of the Finns. Only two U.S. yards, Tacoma with an 8,500 hp vessel and Halter with a 12,000 hp vessel, have built Arctic vessels. In view of these developments, at least seven U.S. yards unveiled their designs for Arctic vessels at the recent WorkBoat Show, with an even split between licenses for foreign designs and in-house designs. While the numbers of vessels are not large, the cost is \$10 million to \$15 million for icebreakers, so the business can make a significant impact on the industry. Unfortunately, these vessels, because of their size, complexity and hull thickness, tend to be beyond the capability of the smaller yards.

Government contracts are also a bright spot, but again, not for everyone. At least six substantial contracts are to be awarded in the next year. Two problems are evident with government contracting in our industry. Proper administrative procedures must be initiated to satisfy government audit, a costly process, particularly if only a portion of

your business is subject to it. Secondly, the small-business set aside is in effect, and if you have more than 1,000 employees, can disqualify you as a bidder on many smaller vessel contracts.

The third bright spot is replacement contracts. Major operators have found that in this overbuilt market, they cannot place their old, obsolete vessels in competition with newer vessels. The well-financed operating companies who are long-term players will start to buy replacement vessels once the market shows signs of returning in order to take advantage of presently depressed new building prices.

What about future trends in the industry? Three are worth mentioning: new vessel designs; the export of technology rather than steel; and the increasing requirement for design and production sophistication in order to operate successfully internationally. Aside from the Arctic vessels previously mentioned, new vessel designs include the following: air cushion vehicles; surface effect ships (SES), which are rigid side-hull air cushion vehicles; and submerged wide angle twin hull vessels (SWATH). SES vessels have proved their capabilities as crewboats, but have not been more widely used because their higher initial cost requires runs of high passenger miles. If economically successful, the smaller SES should be more than competitive with crewboats. SWATH vessel technology is relatively new, although the U.S. Coast Guard has had a test vessel in operation for 7 years. The submerged hull provides stable operation in rough seas and has less hull drag than a conventional hull. Commercial application will probably depend on the successful testing of hulls contemplated by the Coast Guard and Navy.

Another important future trend is the need to export technology rather than finished hulls. It is becoming very difficult for an American yard to export finished vessels because of the following:

- 1) Mobilization costs to a foreign location are no longer being paid by the end user and therefore, must be considered in the cost of the vessel;
- 2) The U.S. has no competitive export financing scheme;
- 3) The dollar is too strong in relation to other currencies;
- 4) The nationalistic sentiments of many foreign governments require local construction;
- 5) Many foreign yards are government-owned or government-subsidized.

Accordingly, U.S. yards can compete by exporting technology to assist yards in developing countries to build their own vessels. Technical assistance can be given on a joint venture or on a royalty basis, to name the two most common forms of cooperation.

To compete in the international marketplace, our industry has to increase its design and production expertise. More and more of our foreign competition is in the form of huge, government-owned or subsidized yards, frequently moving from heavy ship construction to large,

oilfield vessels. These yards have sophistication, capital equipment and technical staffs. Shipyards spawned not many years ago on the banks of the bayous, no longer have a locked-in worldwide market for oilfield supply vessels. These vessels are becoming larger, more complex and are frequently custom designs. To compete with foreign yards for these vessels, we have to improve our skills and designs and make additional capital investment. The catch 22 in this is that, in this depressed world market, few users are willing to pay for this expertise and money is not available to improve our capabilities.

Yes, we in the boat building business are in trouble. We are in trouble because our customer, the operator, is in trouble, as is his customer, the oil company. But in time, they will get well and we will get well. But by then, there will be a whole lot fewer of us. Gloomy as it is, it is the natural selection process of a free-market society. In the interim, the task for all of us is to work smarter and harder and to take advantage of the trends in order to ensure our organization will be one of the survivors.

